

Sophomore PSAT Training Packet

Science Department
Answer Key

PSAT/NMSQT®

Practice Test #1

Answer Explanations

Preliminary SAT/National Merit Scholarship Qualifying Test
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Question 20

The passage is written from the perspective of someone who is

- A) actively involved in conducting hibernator research.
- B) a participant in a recent debate in the field of cardiology.
- C) knowledgeable about advances in hibernator research.
- D) an advocate for wildlife preservation.

Item Difficulty: Hard

Content: Rhetoric / Analyzing point of view

Best Answer: C

Choice C is the best answer. The author is someone who knows about advances in hibernator research but isn't necessarily an active participant in that research.

Choice A is incorrect because the passage mentions that "Fröbert and his colleagues" (line 32) are conducting hibernator research. Choice B is incorrect because the passage discusses the heart health of bears but never provides evidence that this research is contested. Choice D is incorrect because the passage focuses on hibernating animals and their health more than wildlife preservation.

Question 21

It is reasonable to conclude that the main goal of the scientists conducting the research described in the passage is to

- A) learn how the hibernation patterns of bears and squirrels differ.
- B) determine the role that fat plays in hibernation.
- C) illustrate the important health benefits of exercise for humans.
- D) explore possible ways to prevent human diseases.

Item Difficulty: Medium

Content: Information and Ideas / Reading closely

Best Answer: D

Choice D is the best answer. The author begins the passage by suggesting that the bear hibernation research may be beneficial to human health: "Understanding how hibernators, including ground squirrels, marmots and bears, survive their long winter's naps may one day offer solutions for problems such as heart disease, osteoporosis and muscular dystrophy" (lines 1-5). In the last paragraph of the passage, the author suggests that Fröbert hopes to use his research findings to "stave off hardened arteries in humans as well" (lines 76-77).

Choice A is incorrect because the passage briefly mentions ground squirrels and does not specifically compare them to bears. Choice B is incorrect because the passage clearly states that during hibernation fat acts as fuel for a resting animal.

Choice C is incorrect because the passage discusses exercise only within the context of bears.

Question 22

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 1-5 (“Understanding . . . dystrophy”)
- B) Lines 10-13 (“Fat . . . squirrels”)
- C) Lines 31-35 (“To . . . bears”)
- D) Lines 42-46 (“Once . . . tissues”)

Item Difficulty: Medium

Content: Information and Ideas / Citing textual evidence

Best Answer: A

Choice A is the best answer. This sentence supports the idea that one of the goals of the hibernation research discussed in the passage is to try to improve human health: “Understanding how hibernators, including ground squirrels, marmots and bears, survive their long winter’s naps may one day offer solutions for problems such as heart disease, osteoporosis and muscular dystrophy” (lines 1-5).

Choices B, C, and D are incorrect because they do not address the main goal of the hibernator research. Choice B is incorrect because lines 10-13 describe only one aspect of hibernation: fat as fuel. Choices C and D are incorrect because lines 31-35 and 42-46 describe the field research, not the goal of this research.

Question 23

What main effect do the quotations by Andrews in lines 10-18 have on the tone of the passage?

- A) They create a bleak tone, focusing on the difficulties hibernators face during the winter.
- B) They create a conversational tone, relating scientific information in everyday language.
- C) They create an ominous tone, foreshadowing the dire results of Andrews’s research.
- D) They create an absurd tone, using images of animals acting as if they were human.

Item Difficulty: Medium

Content: Rhetoric / Analyzing word choice

Best Answer: B

Choice B is the best answer. In lines 10-18 the molecular biologist Matthew Andrews explains how fat is important to hibernating animals, stating “Fat is where it’s at” and “You bring your own lunch with you.” The use of this nonscientific language creates a conversational tone that allows readers to understand what might otherwise be a complex topic.

Choices A, C, and D are incorrect because Andrews’s phrases, such as “Fat is where it’s at,” are relaxed rather than bleak, ominous, or absurd.

Question 24

As used in line 19, “stores” most nearly means

- A) preservatives.
- B) reserves.
- C) stacks.
- D) shelters.

Item Difficulty: Medium

Content: Information and Ideas / Interpreting words and phrases in context

Best Answer: B

Choice B is the best answer. Lines 19-20 describe how fat is important to hibernating animals, as “[b]igger fat stores mean a greater chance of surviving until spring.” In this context, hibernating animals have “stores,” or reserves, of fat that they put away for later use.

Choices A, C, and D are incorrect because in this context “stores” does not mean preservatives, stacks, or shelters.

Question 25

Based on the passage, what is Fröbert’s hypothesis regarding why bears’ arteries do not harden during hibernation?

- A) The bears’ increased plasma cholesterol causes the arteries to be more flexible.
- B) Sluggish circulation pinches off the blood vessels rather than hardening the arteries.
- C) Bears exercise in short, infrequent bursts during hibernation, which staves off hardened arteries.
- D) Bears possess a molecule that protects against hardened arteries.

Item Difficulty: Medium

Content: Information and Ideas / Reading closely

Best Answer: D

Choice D is the best answer. The passage concludes by noting that “Fröbert hopes to find some protective molecule that could stave off hardened arteries in humans as well” (lines 75-77). This makes clear the scientist’s belief that even though bears begin hibernation while “‘very, very fat’” (lines 62-63) and do not exercise for many months, these animals have some molecule that protects them from hardened arteries.

Choices A and B are incorrect because lines 58-69 explain that the bears’ elevated plasma cholesterol levels combined with the sluggish circulation that results from their lack of exercise during hibernation “are a recipe for hardened arteries” (lines 67-68). Choice C is incorrect because lines 63-64 state that hibernating bears “get zero exercise during hibernation.”

Question 26

Which choice provides the best evidence for the answer to the previous question?

- A) Lines 19-20 (“Bigger . . . spring”)
- B) Lines 24-27 (“The brown . . . day”)
- C) Lines 70-73 (“Even . . . streaks”)
- D) Lines 74-77 (“It’s . . . well”)

Item Difficulty: Medium

Content: Information and Ideas / Citing textual evidence

Best Answer: D

Choice D is the best answer. The passage concludes by noting that “Fröbert hopes to find some protective molecule that could stave off hardened arteries in humans as well” (lines 75-77). This sentence explains Fröbert’s hypothesis that the reason bears do not “build up such artery-hardening streaks” (lines 72-73) is because they have some molecule that protects them from hardened arteries.

Choices A, B, and C are incorrect because they do not address Fröbert’s hypothesis. Choice A is incorrect because lines 19-20 highlight the importance of fat to hibernators. Choice B is incorrect because lines 24-27 describe the diet of one group of hibernating bears. Choice C is incorrect because lines 70-73 describe the hardening of arteries in inactive humans.

Question 27

What information discussed in paragraph 10 (lines 58-69) is represented by the graph?

- A) The information in lines 58-62 (“Recent . . . reported”)
- B) The information in lines 62-64 (“These . . . hibernation”)
- C) The information in lines 64-66 (“Lolling . . . circulation”)
- D) The information in lines 67-69 (“It’s . . . strokes”)

Item Difficulty: Medium

Content: Synthesis / Analyzing quantitative information

Best Answer: A

Choice A is the best answer. The graph compares the total plasma cholesterol found in seven bears during periods of their hibernation and nonhibernation, exemplifying how that cholesterol is generally higher during the hibernating stage. Meanwhile, lines 58-62 describe the very phenomena that the graph depicts: “Recent analyses revealed that Scandinavian brown bears spend the summer with plasma cholesterol levels considered high for humans; those values then increase substantially for hibernation, Fröbert and his colleagues reported.”

Choices B, C, and D are incorrect because none of the other lines in paragraph 10 discuss the comparative levels of plasma cholesterol found in bears during their hibernating and nonhibernating phases. Lines 62-64 describe how bears spend their hibernating phase. Lines 64-66 describe the poor circulation those bears experience during hibernation. Lines 67-69 explain the heart risks that may occur in humans who are overweight and inactive.

Question 28

Which statement about the effect of hibernation on the seven bears is best supported by the graph?

- A) Only one of the bears did not experience an appreciable change in its total plasma cholesterol level.
- B) Only one of the bears experienced a significant increase in its total plasma cholesterol level.
- C) All of the bears achieved the desirable plasma cholesterol level for humans.
- D) The bear with the lowest total plasma cholesterol level in its active state had the highest total plasma cholesterol level during hibernation.

Item Difficulty: Medium

Content: Synthesis / Analyzing quantitative information

Best Answer: A

Question 37

As used in line 82, “in its train” is closest in meaning to

- (A) before it.
- (B) with it.
- (C) anticipating it.
- (D) advancing it.

Item Difficulty: Medium

Content: Information and Ideas / Interpreting words and phrases in context

Best Answer: B

Choice B is the best answer. In the final paragraph of the passage, Carnegie writes of the “law of competition” (lines 76-77), explaining that the law has some costs but also provides improved living conditions for everyone “in its train.” Saying these conditions come “in the train” of the law means they accompany the law or come with it.

Choices A, C, and D are incorrect because in this context “in its train” does not mean precede the law, predict the arrival of the law, or help advance the law.

Question 38

S2

The author of Passage 1 suggests that the usefulness of de-extinction technology may be limited by the

- (A) amount of time scientists are able to devote to genetic research.
- (B) relationship of an extinct species to contemporary ecosystems.
- (C) complexity of the DNA of an extinct species.
- (D) length of time that a species has been extinct.

Item Difficulty: Medium

Content: Information and Ideas / Reading closely

Best Answer: D

Choice D is the best answer. Lines 9-11 explain that, although some extinct species can be brought back to life, “Only species whose DNA is too old to be recovered, such as dinosaurs, are the ones to consider totally extinct, bodily and genetically.” The determining factor is the length of time that species has been extinct.

Choices A, B, and C are incorrect because lines 9-11 explicitly state that only DNA that is “too old to be recovered” determines whether a species can be brought back to life, not the amount of time scientists devote to genetic research, the relationship between an extinct species and contemporary ecosystems, or how complex a species’ DNA might be.

Question 39

Which choice provides the best evidence for the answer to the previous question?

- (A) Lines 7-9 (“Thanks . . . life”)
- (B) Lines 9-11 (“Only . . . genetically”)
- (C) Line 13 (“It will be . . . difficult”)
- (D) Lines 13-14 (“It will take . . . succeed”)

Item Difficulty: Medium

Content: Information and Ideas / Citing textual evidence

Best Answer: B

Choice B is the best answer. Lines 9-11 state that species that have DNA that is “too old to be recovered” cannot be brought back to life.

Choices A, C, and D are incorrect because they do not indicate any limits to de-extinction technology. Choice A is incorrect because lines 7-9 explain only that the use of DNA can lead to certain species being brought back to life. Choices C and D are incorrect because line 13 and lines 13-14 explain some challenges to bringing back certain species but do not explain the limits to de-extinction technology.

Question 40

As used in line 27, “deepest” most nearly means

- (A) most engrossing.
- (B) most challenging.
- (C) most extensive.
- (D) most fundamental.

Item Difficulty: Hard

Content: Information and Ideas / Interpreting words and phrases in context

Best Answer: D

Choice D is the best answer. Lines 24-27 explain that “Just the thought of mammoths and passenger pigeons alive again invokes the awe and wonder that drives all conservation at its deepest level.” The author of Passage 1 is suggesting that the “prospect of de-extinction” (line 21) evokes the same emotions of “awe and wonder” that propel conservation efforts at its deepest, or most fundamental, level.

Choices A, B, and C are incorrect because in this context the “deepest” level of conservation does not mean the most engrossing level, most challenging level, or most extensive level.

Question 41

The authors of Passage 2 indicate that the matter of shrinking biodiversity should primarily be considered a

- (A) historical anomaly.
- (B) global catastrophe.
- (C) scientific curiosity.
- (D) political problem.

Item Difficulty: Medium

Content: Information and Ideas / Reading closely

Best Answer: B

Choice B is the best answer. “Shrinking biodiversity” means the loss of species, and the authors of Passage 2 clearly state that shrinking biodiversity is a global issue: “Species today are vanishing in such great numbers—many from hunting and habitat destruction—that the trend has been called a sixth mass extinction, an event on par with such die-offs as the one that befell the dinosaurs 65 million years ago” (37-41). Labeling this loss of diversity a “mass extinction,” shows that the authors believe this situation is serious and widespread.

Choice A is incorrect because the passage states the current loss of biodiversity would be a “sixth” mass extinction, indicating that the occurrence is far from an anomaly (or abnormality). Choices C and D are incorrect because the authors of Passage 2 do not primarily present the shrinking biodiversity as a scientific curiosity or a political problem.

Question 42

Which choice provides the best evidence for the answer to the previous question?

- (A) Lines 37-41 (“Species . . . ago”)
- (B) Lines 42-45 (“A program . . . woes”)
- (C) Lines 53-56 (“Against . . . irresponsible”)
- (D) Lines 65-67 (“Such . . . grave”)

Item Difficulty: Medium

Content: Information and Ideas / Citing textual evidence

Best Answer: A

Choice A is the best answer. Lines 37-41 label the shrinking biodiversity as a global catastrophe, as it is “a sixth mass extinction, an event on par with such die-offs as the one that befell the dinosaurs 65 million years ago.” Labeling this loss of

diversity a “mass extinction” implies the authors’ belief that this shrinking biodiversity is serious and widespread.

Choices B, C, and D do not explain the authors’ opinions on shrinking biodiversity. Choices B and C are incorrect because lines 42-45 and 53-56 describe what the authors view as possible problems with de-extinction. Choice D is incorrect because lines 65-67 provide one reason to continue with de-extinction programs.

Question 43

As used in line 37, “great” most nearly means

- (A) lofty.
- (B) wonderful.
- (C) large.
- (D) intense.

Item Difficulty: Easy

Content: Information and Ideas / Interpreting words and phrases in context

Best Answer: C

Choice C is the best answer. Lines 37-40 state that “species today are vanishing at such great numbers” that the loss of these species is considered a “sixth mass extinction.” In this context, there is a “great,” or large, number of species at risk of extinction.

Choice A, B, and D are incorrect because in this context, “great,” does not mean lofty, wonderful, or intense.

Question 44

The reference to the “black-footed ferret and the northern white rhino” (line 64) serves mainly to

- (A) emphasize a key distinction between extinct and living species.
- (B) account for types of animals whose numbers are dwindling.
- (C) provide examples of species whose gene pools are compromised.
- (D) highlight instances of animals that have failed to adapt to new habitats.

Item Difficulty: Medium

Content: Rhetoric / Analyzing text structure

Best Answer: C

Choice C is the best answer. The authors of Passage 2 suggest that de-extinction may “help save endangered species.” (line 60). Lines 61-64 provide an example of how de-extinction could be beneficial: “For example, extinct versions of genes

could be reintroduced into species and subspecies that have lost a dangerous amount of genetic diversity, such as the black-footed ferret and the northern white rhino." In this context, the black-footed ferret and northern white rhino are used as examples of species that have lost genetic diversity; in other words, they are species whose gene pools have been compromised.

Choices A, B, and D are incorrect because lines 61-64 clearly identify the black-footed ferret and the northern white rhino as species whose gene pools have been compromised. They are not highlighted to emphasize any difference between extinct and living species, to explain why the numbers of some animals are dwindling, or to describe species that failed to adapt to new environments.

Question 45

Which choice best states the relationship between the two passages?

- (A) Passage 2 attacks a political decision that Passage 1 strongly advocates.
- (B) Passage 2 urges caution regarding a technology that Passage 1 describes in favorable terms.
- (C) Passage 2 expands on the results of a research study mentioned in Passage 1.
- (D) Passage 2 considers practical applications that could arise from a theory discussed in Passage 1.

Item Difficulty: Medium

Content: Synthesis / Analyzing multiple texts

Best Answer: B

Choice B is the best answer. Passage 1 enthusiastically supports the idea of de-extinction, saying it is "profound news. That something as irreversible and final as extinction might be reversed is a stunning realization" (lines 22-24). Passage 2, on the other hand, recognizes the "gee-whiz appeal" (line 29) of de-extinction but is less certain about its implementation: "Yet with limited intellectual bandwidth and financial resources to go around, de-extinction threatens to divert attention from the modern biodiversity crisis" (lines 30-33). Therefore, Passage 2 urges restraint for an idea that Passage 1 enthusiastically supports.

Choice A is incorrect because neither passage focuses on a political decision. Choice C is incorrect because Passage 1 does not mention a research study. Choice D is incorrect because Passage 2 does not consider practical uses (or "applications") of de-extinction as much as the practical problems that result from its use.

Question 46

How would the authors of Passage 2 most likely respond to the “prospect” referred to in line 21, Passage 1?

- (A) With approval, because it illustrates how useful de-extinction could be in addressing widespread environmental concerns.
- (B) With resignation, because the gradual extinction of many living species is inevitable.
- (C) With concern, because it implies an easy solution to a difficult problem.
- (D) With disdain, because it shows that people have little understanding of the importance of genetic diversity.

Item Difficulty: Hard

Content: Synthesis / Analyzing multiple texts

Best Answer: C

Choice C is the best answer. The author of passage 1 is amazed by the idea of de-extinction, while the authors of passage 2 warn that a “program to restore extinct species poses a risk of selling the public on a false promise that technology alone can solve our ongoing environmental woes” (lines 42-45). This statement shows that the authors of Passage 2 view de-extinction as a “false promise” that may make the problem of shrinking biodiversity appear easier to solve than it actually will be.

Choice A is incorrect because the authors of Passage 2 are less enthusiastic about the “prospect” of de-extinction than the author of Passage 1, as they state that de-extinction “threatens to divert attention from the modern biodiversity crisis” (lines 32-33). Choice B is incorrect because, while the authors of Passage 2 acknowledge that some extinctions may be inevitable, they are not resigned to de-extinction. Choice D is incorrect because the authors of Passage 2 do not suggest that people have little understanding of the biodiversity crisis.

Question 47

Which choice would best support the claim that the authors of Passage 2 recognize that the “imagination soars” (line 24, Passage 1) in response to de-extinction technology?

- (A) Lines 28-30 (“The . . . news”)
- (B) Lines 30-33 (“Yet . . . crisis”)
- (C) Lines 58-59 (“That . . . altogether”)
- (D) Lines 61-63 (“For . . . diversity”)

Item Difficulty: Medium

Content: Synthesis / Analyzing multiple texts

Best Answer: A

Choice A is the best answer. In lines 22-24, the author of Passage 1 writes: “That something as irreversible and final as extinction might be reversed is a stunning realization. The imagination soars.” This enthusiasm for such an exciting possibility is also recognized in Passage 2, which states in lines 28-30 that “The idea of bringing back extinct species holds obvious gee-whiz appeal and a respite from a steady stream of grim news.” By conceding that there is “gee-whiz appeal” to de-extinction, the authors of Passage 2 recognize that it is an idea that makes the “imagination [soar].”

Choice B is incorrect because lines 30-33 explain why de-extinction is a threat. Choice C is incorrect because lines 58-59 concede only that the idea of de-extinction is not entirely without merit, a characterization which is far less enthusiastic than the statement “the imagination soars.” Choice D is incorrect because lines 61-63 provide a single example of when de-extinction might be appropriate.

Answer Key

Reading		Writing & Language		Math Test – No Calculator		Math Test – Calculator	
Q 1	A	Q 1	C	Q 1	A	Q 1	C
Q 2	A	Q 2	D	Q 2	B	Q 2	A
Q 3	B	Q 3	C	Q 3	A	Q 3	C
Q 4	C	Q 4	D	Q 4	D	Q 4	C
Q 5	C	Q 5	C	Q 5	B	Q 5	C
Q 6	B	Q 6	A	Q 6	B	Q 6	D
Q 7	B	Q 7	B	Q 7	A	Q 7	D
Q 8	D	Q 8	B	Q 8	D	Q 8	D
Q 9	B	Q 9	B	Q 9	B	Q 9	C
Q 10	C	Q 10	D	Q 10	D	Q 10	B
Q 11	B	Q 11	D	Q 11	C	Q 11	C
Q 12	A	Q 12	C	Q 12	A	Q 12	B
Q 13	A	Q 13	B	Q 13	D	Q 13	B
Q 14	D	Q 14	B	Q 14	300	Q 14	B
Q 15	D	Q 15	B	Q 15	2	Q 15	B
Q 16	A	Q 16	D	Q 16	9	Q 16	C
Q 17	D	Q 17	A	Q 17	4	Q 17	C
Q 18	C	Q 18	A			Q 18	C
Q 19	D	Q 19	D			Q 19	A
Q 20	C	Q 20	C			Q 20	C
Q 21	D	Q 21	C			Q 21	C
Q 22	A	Q 22	A			Q 22	B
Q 23	B	Q 23	D			Q 23	D
Q 24	B	Q 24	A			Q 24	A
Q 25	D	Q 25	A			Q 25	A
Q 26	D	Q 26	B			Q 26	D
Q 27	A	Q 27	C			Q 27	A
Q 28	A	Q 28	D			Q 28	6
Q 29	B	Q 29	C			Q 29	9
Q 30	C	Q 30	D			Q 30	510
Q 31	D	Q 31	D			Q 31	10.2, 51/5
Q 32	C	Q 32	D				
Q 33	B	Q 33	A				
Q 34	D	Q 34	C				
Q 35	C	Q 35	A				
Q 36	D	Q 36	D				
Q 37	B	Q 37	D				
Q 38	D	Q 38	C				
Q 39	B	Q 39	B				
Q 40	D	Q 40	C				
Q 41	B	Q 41	B				
Q 42	A	Q 42	B				
Q 43	C	Q 43	A				
Q 44	C	Q 44	D				
Q 45	B						
Q 46	C						
Q 47	A						

QUESTION 22.

Choice B is the best answer. Lines 2-4 of the passage describe DNA as “a very long chain, the backbone of which consists of a regular alternation of sugar and phosphate groups.” The backbone of DNA, in other words, is the main structure of a chain made up of repeating units of sugar and phosphate.

Choice A is incorrect because the passage describes DNA on the molecular level only and never mentions the spinal column of organisms. Choice C is incorrect because the passage describes the backbone of the molecule as having “a regular alternation” of sugar and phosphate, not one or the other. Choice D is incorrect because the nitrogenous bases are not the main structural unit of DNA; rather, they are attached only to the repeating units of sugar.

QUESTION 23.

Choice D is the best answer. The authors explain that hydrogen bonds join together pairs of nitrogenous bases, and that these bases have a specific structure that leads to the pairing: “One member of a pair must be a purine and the other a pyrimidine in order to bridge between the two chains” (lines 27-29). Given the specific chemical properties of a nitrogenous base, it would be inaccurate to call the process random.

Choice A is incorrect because lines 5-6 describe how nitrogenous bases attach to sugar but not how those bases pair with one another. Choice B is incorrect because lines 9-10 do not contradict the student’s claim. Choice C is incorrect because lines 23-25 describe how the two molecules’ chains are linked, not what the specific pairing between nitrogenous bases is.

QUESTION 24.

Choice D is the best answer. In lines 12-14 the authors state: “the first feature of our structure which is of biological interest is that it consists not of one chain, but of two.”

Choices A and B are incorrect because lines 12-14 explicitly state that it is the two chains of DNA that are of “biological interest,” not the chemical formula of DNA, nor the common fiber axis those two chains are wrapped around. Choice C is incorrect because, while the X-ray evidence did help Watson and Crick to discover that DNA consists of two chains, it was not claimed to be the feature of biological interest.

QUESTION 25.

Choice C is the best answer. In lines 12-14 the authors claim that DNA molecules appear to be comprised of two chains, even though “it has often been assumed . . . there would be only one” (lines 15-17). The authors support this claim with evidence compiled from an X-ray: “the density, taken with the X-ray evidence, suggests very strongly that there are two [chains]” (lines 18-19).

Choices A, B, and D are incorrect because the authors mention density and X-ray evidence to support a claim, not to establish that DNA carries genetic information, present a hypothesis about the composition of a nucleotide, or confirm a relationship between the density and chemical formula of DNA.

QUESTION 26.

Choice B is the best answer. The authors explain that “only certain pairs of bases will fit into the structure” (lines 25-26) of the DNA molecule. These pairs must contain “a purine and the other a pyrimidine in order to bridge between the two chains” (lines 27-29), which implies that any other pairing would not “fit into the structure” of the DNA molecule. Therefore, a pair of purines would be larger than the required purine/pyrimidine pair and would not fit into the structure of the DNA molecule.

Choice A is incorrect because this section is not discussing the distance between a sugar and phosphate group. Choice C is incorrect because the passage never makes clear the size of the pyrimidines or purines in relation to each other, only in relation to the space needed to bond the chains of the DNA molecule. Choice D is incorrect because the lines do not make an implication about the size of a pair of pyrimidines in relation to the size of a pair consisting of a purine and a pyrimidine.

QUESTION 27.

Choice D is the best answer. The authors explain how the DNA molecule contains a “precise sequence of bases” (lines 43-44), and that the authors can use the order of bases on one chain to determine the order of bases on the other chain: “If the actual order of the bases on one of the pair of chains were

given, one could write down the exact order of the bases on the other one, because of the specific pairing. Thus one chain is, as it were, the complement of the other, and it is this feature which suggests how the deoxyribonucleic acid molecule might duplicate itself” (lines 45-51). The authors use the words “exact,” “specific,” and “complement” in these lines to suggest that the base pairings along a DNA chain is understood and predictable, and may explain how DNA “duplicate[s] itself” (line 51).

Choice A is incorrect because the passage does not suggest that most nucleotide sequences are known. Choice B is incorrect because these lines are not discussing the random nature of the base sequence along one chain of DNA. Choice C is incorrect because the authors are describing the bases attached only to the sugar, not to the sugar-phosphate backbone.

QUESTION 28.

Choice C is the best answer. Lines 6-7 state that “Two of the possible bases—adenine and guanine—are purines,” and on the table the percentages of adenine and guanine in yeast DNA are listed as 31.3% and 18.7% respectively.

Choices A, B, and D are incorrect because they do not state the percentages of both purines, adenine and guanine, in yeast DNA.

QUESTION 29.

Choice A is the best answer. The authors state: “We believe that the bases will be present almost entirely in their most probable forms. If this is true, the conditions for forming hydrogen bonds are more restrictive, and the only pairs of bases possible are: adenine with thymine, and guanine with cytosine” (lines 31-35). The table shows that the pairs adenine/thymine and guanine/cytosine have notably similar percentages in DNA for all organisms listed.

Choice B is incorrect. Although the choice of “Yes” is correct, the explanation for that choice misrepresents the data in the table. Choices C and D are incorrect because the table does support the authors’ proposed pairing of nitrogenous bases in DNA molecules.

QUESTION 30.

Choice A is the best answer because it gives the percentage of cytosine (17.3%) in sea urchin DNA and the percentage of guanine (17.7%) in sea urchin DNA. Their near similar pairing supports the authors’ proposal that possible pairings of nitrogenous bases are “adenine with thymine, and guanine with cytosine” (line 35).

Choices B, C, and D do not provide the best evidence for the answer to the previous question. Choice B (cytosine and thymine), Choice C (cytosine and adenine), and Choice D (guanine and adenine) are incorrect because they show pairings of nitrogenous bases that do not compose a similar percentage of the bases in sea urchin DNA.

S3

QUESTION 31.

Choice D is the best answer. The table clearly shows that the percentage of adenine in each organism's DNA is different, ranging from 24.7% in *E.coli* to 33.2% in the octopus. That such a variability would exist is predicted in lines 41-43, which states that "in a long molecule many different permutations are possible."

Choices A and B are incorrect because the table shows that the percentage of adenine varies between 24.7% and 33.2% in different organisms. Choice C is incorrect because lines 36-38 state that adenine pairs with thymine but does not mention the variability of the base composition of DNA.

QUESTION 42.

Choice B is the best answer. The author of Passage 1 identifies specific companies such as the “Planetary Resources of Washington,” “Deep Space Industries of Virginia,” and “Golden Spike of Colorado” to support his earlier assertion that there are many interested groups “working to make space mining a reality” (line 8).

Choices A, C, and D are incorrect because the author of Passage 1 does not mention these companies to profile the technological advances in space mining, the profit margins from space mining, or the diverse approaches to space mining.

QUESTION 43.

Choice A is the best answer. The author of Passage 1 explicitly states that one benefit to space mining is access to precious metals and earth elements: “within a few decades, [space mining] may be meeting earthly demands for precious metals, such as platinum and gold, and the rare earth elements vital for personal electronics, such as yttrium and lanthanum” (lines 18-22).

Choice B is incorrect because Passage 1 does not suggest that precious metals extracted from space may make metals more valuable on Earth. Choice C and Choice D are incorrect because Passage 1 never mentions how space mining could create unanticipated technological innovations or change scientists’ understanding of space resources.

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QUESTION 44.

Choice A is the best answer. Lines 18-22 suggest that space mining may help meet “earthly demands for precious metals . . . and the rare earth elements vital for personal electronics.” In this statement, the author is stating materials (“metals,” “earth elements”) that may be gathered as a result of space mining, and that these materials may be important to Earth’s economy.

Choices B, C, and D do not provide the best evidence for the answer to the previous question. Choice B is incorrect because lines 24-28 focus on an “off-planet economy” but never address positive effects of space mining. Choice C is incorrect because lines 29-30 suggest the relative value of water found in space. Choice D is incorrect because lines 41-44 state that space mining companies hope to find specific resources in lunar soil and asteroids but do not address how these resources are important to Earth’s economy.

QUESTION 45.

Choice D is the best answer. The author suggests in lines 19-22 that space mining may meet “earthly demands for precious metals, such as platinum and gold, and the rare earth elements vital for personal electronics.” In this sentence, “earthly demands” suggests that people want, or desire, these precious metals and rare earth elements.

Choices A, B, and C are incorrect because in this context “demands” does not mean offers, claims, or inquiries.

QUESTION 46.

Choice C is the best answer. Lines 29-30 introduce the idea that water mined in space may be very valuable: “water mined from other worlds could become the most desired commodity.” Lines 35-40 support this assertion by suggesting how mined space water could be used “for drinking or as a radiation shield” (lines 36-37) or to make “spacecraft fuel” (line 38).

Choice A is incorrect because the comparison in the previous paragraph (the relative value of gold and water to someone in the desert) is not expanded upon in lines 35-40. Choice B is incorrect because the question asked in the previous paragraph is also answered in that paragraph. Choice D is incorrect because no specific proposals are made in the previous paragraph; rather, an assertion is made and a question is posed.

QUESTION 47.

Choice B is the best answer. The author of Passage 2 recognizes that space mining may prove beneficial to humanity, stating that “we all stand to gain: the mineral bounty and spin-off technologies could enrich us all” (lines 50-52). The author also repeatedly mentions that space mining should be carefully considered before it is implemented: “But before the miners

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start firing up their rockets, we should pause for thought” (lines 53-54); “But [space mining’s] consequences—both here on Earth and in space—merit careful consideration” (lines 57-59).

Choice A is incorrect because the author of Passage 2 concedes that “space mining seems to sidestep most environmental concerns” (lines 55-56) but does not imply that space mining will recklessly harm the environment, either on Earth or in space. Choice C is incorrect because the author of Passage 2 does not address any key resources that may be disappearing on Earth. Choice D is incorrect because the author of Passage 2 admits that “resources that are valuable in orbit and beyond may be very different to those we prize on Earth” (lines 74-76) but does not mention any disagreement about the commercial viabilities of space mining discoveries.

QUESTION 48.

Choice A is the best answer. In lines 60-66, the author presents some environmental arguments against space mining: “[space] is not ours to despoil” and we should not “[glut] ourselves on space’s riches.” The author then suggests that these environmental arguments will be hard to “hold,” or maintain, when faced with the possible monetary rewards of space mining: “History suggests that those will be hard lines to hold . . .” (line 68).

Choices B, C, and D are incorrect because in this context, “hold” does not mean grip, restrain, or withstand.

QUESTION 49.

Choice D is the best answer. The author of Passage 1 is excited about the possibilities of space mining and how it can yield valuable materials, such as metals and elements (lines 19-20 and lines 41-42), water ice (line 35), and space dirt (line 44). The author of Passage 2, on the other hand, recognizes the possible benefits of space mining but also states that space mining should be thoughtfully considered before being implemented. Therefore, the author of Passage 2 expresses some concerns about a concept discussed in Passage 1.

Choice A is incorrect because the author of Passage 2 does not refute the central claim of Passage 1; both authors agree there are possible benefits to space mining. Choice B is incorrect because the author of Passage 1 does not describe space mining in more general terms than does the author of Passage 2. Choice C is incorrect because the author of Passage 2 is not suggesting that the space mining proposals stated in Passage 1 are impractical.

QUESTION 50.

Choice B is the best answer. In lines 18-28, the author of Passage 1 describes many of the possible economic benefits of space mining, including the

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building of “an off-planet economy” (line 25). The author of Passage 2 warns that there may be ramifications to implementing space mining and building an “emerging off-world economy” (line 73) without regulation: “But miners have much to gain from a broad agreement on the for-profit exploitation of space. Without consensus, claims will be disputed, investments risky, and the gains made insecure” (lines 83-87).

Choices A, C, and D are incorrect because the author of Passage 2 does not suggest that the benefits to space mining mentioned in lines 18-28 of Passage 1 are unsustainable, unachievable, or will negatively affect Earth’s economy. Rather, the author recognizes the benefits of space mining but advocates for the development of regulation procedures.

QUESTION 51.

Choice D is the best answer. In lines 85-87, the author of Passage 2 states that the future of space mining will prove difficult without regulations because “claims will be disputed, investments risky, and the gains made insecure.”

Choices A, B, and C are incorrect because they do not provide the best evidence for the answer to the previous question. Choice A is incorrect because lines 60-63 present some environmental concerns toward space mining. Choice B is incorrect because lines 74-76 focus on how space mining may discover valuable resources that are different from the ones found on Earth. Choice C is incorrect because lines 81-83 simply describe one person’s objections to the regulation of the space mining industry.

QUESTION 52.

Choice A is the best answer because both Passage 1 and Passage 2 indicate a belief that the resources most valued in space may differ from those most valued on our planet. Passage 2 says this explicitly in lines 74-76: “The resources that are valuable in orbit and beyond may be very different to those we prize on Earth.” Meanwhile Passage 1 suggests that water mined from space may be more valuable than metals or other earth elements when creating an “off-planet economy” (lines 25-30).

Choice B is incorrect because neither passage discusses, either implicitly or explicitly, the need for space mining to be inexpensive. Choice C is incorrect because Passage 2 does not specifically identify precious metals or rare earth elements but instead focuses on theoretical problems with space mining. Choice D is incorrect because diminishing resources on Earth is not discussed in Passage 2.